MediGene Aktiengesellschaft

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PATENT CLAIMS

1. The use of a structural protein of adeno-associated virus (AAV) for purifying AAV and/or AAV particles, characterized in that the structural protein comprises at least one mutation which brings about an alteration in the chromatographic properties of the virus.

2. The use of a structural protein as claimed in claim 1, characterized in that the alteration in the chromatographic properties makes an improvement in the purification possible, in particular a concentration of the virus, preferably of the virus particles, to higher titers, a purification to greater purity and/or a more efficient purification.

3. The use of a structural protein as claimed in either of claims 1 or 2, characterized in that the mutation brings about a negligible reduction in the infectivity of the virus.

4. The use of a structural protein as claimed in any of claims 1 to 3, characterized in that the mutated structural protein is capable of particle formation.

5. The use of a structural protein as claimed in any of claims 1 to 4, characterized in that the mutated structural protein increases the thermal stability.

6. The use of a structural protein as claimed in any

of claims 1 to 5, characterized in that it is selected from mutated VP1, mutated VP2 and/or mutated VP3.

7. The use of a structural protein as claimed in any of claims 1 to 6, characterized in that it is derived from AAV1, AAV2, AAV3, AAV4, AAV5 and/or AAV6 and other AAV serotypes derived therefrom, in particular from AAV2.

8. The use of a structural protein as claimed in any of claims 1 to 7, characterized in that the mutation is a point mutation, a mutation of more than one amino acid, one or more deletion(s), in particular one or more insertion(s) or a combination of said modifications.

9. The use of a structural protein as claimed in any of claims 1 to 8, characterized in that amino acids of a functional sequence which are preferably suitable for affinity chromatography are inserted.

10. The use of a structural protein as claimed in claim 9, characterized in that the inserted amino acid sequence is selected from a ligand of a receptor or the receptor of a ligand, an antibody or part of an antibody, in particular an antibody epitope, an antigen or antigen epitope, a hormone, a hormoreceptor, an enzyme, an enzyme substrate, a lectin, sugar-bearing amino acids, in particular from a histidine-rich peptide (His tag), a multiply charged peptide, glutathione S-transferase (GST tag), an F_c part of an antibody, an immunoglobulin-binding domain, for example protein A or protein G or a part thereof, a lecitin, a nucleic acid binding site, a heparin

binding site, a specific ligand, a specific receptor, an integrin, a cytokine or a receptor binding domain of a cytokine, integrin or growth factor, single-chain antibodies which bind to a cell surface receptor, an antibody against cell surface structures, an epitope and/or an antibody-binding structure.

11. The use of a structural protein as claimed in either of claims 9 or 10, characterized in that a peptide which has the sequence QAGTFALRGDNPQG is inserted.

12. The use of a structural protein as claimed in any of claims 1 to 11, characterized in that the structural protein comprises at least one other mutation.

13. The use of a structural protein as claimed in claim 12, characterized in that the other mutation(s) brings about an alteration in the infectivity of the virus.

14. The use of a structural protein as claimed in either of claims 12 or 13, characterized in that the other mutation(s) brings about a reduction in the antigenicity of the virus.

15. The use of a structural protein as claimed in any of claims 12 to 14, characterized in that the other mutation(s) is/are one or more deletion(s), one or more insertion(s) or a combination of said modifications.

16. The use of a structural protein as claimed in any of claims 12 to 15, characterized in that the insertion is a cell membrane receptor ligand, a

Rep protein or peptide, an immunosuppressive protein or peptide and/or a protein or peptide with a signal for double strand synthesis of the foreign gene.

17. The use of a structural protein as claimed in any of claims 12 to 16, characterized in that the insertion is selected from an integrin, a cytokine or a receptor binding domain of a cytokine, integrin or growth factor, single-chain antibodies which bind to a cell surface receptor, an antibody against cell surface structures, an antibody-binding structure or an epitope.

18. The use of a structural protein as claimed in any of claims 1 to 17, characterized in that the mutation(s) is/are located on the virus surface.

19. The use of a structural protein as claimed in any of claims 1 to 18, characterized in that the mutation(s) is/are located at the N terminus of the structural protein.

20. The use of a structural protein as claimed in any of claims 1 to 19, characterized in that the mutation(s) is/are brought about by one or more insertions in the XhoI cleavage site of the VP1-encoding nucleic acid.

21. The use of a structural protein as claimed in any of claims 1 to 20, characterized in that the mutation(s) is/are brought about by one or more insertions in the BsrBI cleavage site of the VP1-encoding nucleic acid.

22. The use of a structural protein as claimed in any of claims 1 to 21, characterized in that the

mutation(s) is/are brought about by one or more deletions between the BsrBI-HindII cleavage sites of the VP1-encoding nucleic acid and one or more insertions.

23. The use of a structural protein as claimed in any of claims 1 to 22, characterized in that the mutation(s) is/are brought about by one or more deletions between the XhoI-XhoI cleavage sites of the VP1-encoding nucleic acid.

24. The use of a structural protein as claimed in any of claims 1 to 23, characterized in that the mutation(s) is/are brought about by one or more deletions between the BsrBI-HindII cleavage sites of the VP1-encoding nucleic acid.

25. The use of a structural protein as claimed in any of claims 1 to 19, characterized in that one or more insertions in VP3 is/are located before and/or after at least one amino acid in the sequence selected from YKQIS SQSGA, YLTLN NGSQA, YYLSR TNTPS, EEKFF PQSGV, NPVAT EQYGS, LQRGN RQAAT, NVDFT VDTNG.

26. The use of a structural protein as claimed in any of claims 1 to 25 in the form of an AAV particle, in particular in the form of an AAV capsid.